TRANSMITTAL OF APPEAL BRIEF

Docket No.
65765-0085

In re Application of: Chin-Jui Chang et al.

Application No.	Filing Date	Examiner	Group Art Unit
10/759,449-Conf. #7829	January 16, 2004	M. A. Patterson	1794

Invention: SOUND DEADENING AND STRUCTURAL REINFORCEMENT COMPOSITIONS AND METHODS OF USING THE SAME

TO THE COMMISSIONER OF PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: February 23, 2009 .

The fee for filing this Appeal Brief is $ 540.00 .

[X] Large Entity [ ] Small Entity

[ ] A petition for extension of time is also enclosed.

The fee for the extension of time is _____ :

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[X] The Director is hereby authorized to charge any additional fees that may be required or credit any overpayment to Deposit Account No. 18-0013 .

/Linda D. Kennedy/ Dated: April 17, 2009

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Appeal Brief Transmittal

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Dated: April 17, 2009
Electronic Signature for Linda D. Kennedy: /Linda D. Kennedy/

Docket No.: 65765-0085

(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Chin-Jui Chang et al.

Application No.: 10/759,449 Confirmation No.: 7829

Filed: January 16, 2004 Art Unit: 1794

For: SOUND DEADENING AND STRUCTURAL REINFORCEMENT COMPOSITIONS AND METHODS OF USING THE SAME Examiner: M. A. Patterson

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal is from the Final Rejection of claims 1-27 set forth in the Final Office Action dated December 10, 2008. A Notice of Appeal was filed February 23, 2009.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is: Sika Corporation, assignee, a corporation organized and existing under the laws of the state of New Jersey, and having a place of business at 30800 Stephenson Highway, Madison Heights, Michigan 48071.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 27 claims pending in application.

B. Current Status of Claims

Claims 1-27 are finally rejected by the Office Action dated December 10, 2008.

C. Claims On Appeal

Claims 1-27 are on appeal.

IV. STATUS OF AMENDMENTS

Appellant filed a Response After Final Rejection, without amendments to the claims, on February 23, 2009, which the Examiner entered. The amendments to claims 23-27, dated September 9, 2008, were also entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following is a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, as required by 37 C.F.R. § 41.37(c)(1)(v). References to the specification herein are intended to be exemplary and not limiting. There are four independent claims described herein: claims 1, 11, 12 and 13.

Independent claim 1 describes a composition that is useful for forming a reinforcing body. *See* specification page 1, lines 10-25; page 2, lines 7-15. In particular, claim 1 describes a composition that includes the following ingredients: (a) from about 20-30% by weight of an SBS block co-polymer; (b) from about 5-20% by weight polystyrene; (c) from about 0.5-5% by weight of a rubber; and (d) from about 30-45% by weight of an epoxy resin. *See* page 6 of the specification from lines 1 to 11 and example 3 on pages 13-14.

Independent claim 11 describes a composition that is useful for forming a reinforcing body. *See* specification page 1, lines 10-25; page 2, lines 7-15. The composition comprises from about 20-30% by weight of an SBS block co-polymer; from about 5-20% by weight polystyrene; from about 0.5-5% by weight of a rubber; and from about 30-45% by weight of an epoxy resin. *See* page 6 of the specification, lines 1-11. The composition has a percent expansion of from about 80-220% after heating thereof to a temperature of at least about 300°F. *See* page 8 of the specification, lines 9 to 19.

Independent claim 12 describes a composition that is useful for forming a reinforcing body. *See* specification page 1, lines 10-25; page 2, lines 7-15. The composition comprises from about 20-30% by weight of an SBS block co-polymer; from about 5-20% by weight polystyrene; from about 0.5-5% by weight of a rubber; and from about 30-45% by weight of an epoxy resin. *See*

page 6 of the specification, lines 1-11. The composition has a compressive strength of at least about 1400 psi upon being expanded by heating to a temperature of at least about 300°F. *See* page 8 of the specification, lines 9-19.

Independent claim 13 describes a composition that is useful for forming a reinforcing body. *See* specification page 1, lines 10-25; page 2, lines 7-15. The composition comprises from about 20-30% by weight of an SBS block co-polymer; from about 5-20% by weight polystyrene; from about 0.5-5% by weight of a rubber; and from about 30-45% by weight of an epoxy resin. The composition has a compressive strength of at least about 1400 psi and a percent expansion of from about 80-220% upon being expanded by heating to a temperature of at least about 300°F. *See* page 8 of the specification, lines 9-19.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. The final rejection of claims 1, 7, 11-13, 19 and 23-27 under 35 U.S.C. § 102(b) over U.S. Patent No. 4,884,834 ("Yamamoto").

2. The final rejection of claims 2, 4-6, 14 and 16-18 under 35 U.S.C. § 103 over U.S. Patent No. 4,884,834 ("Yamamoto") in view of U.S. Patent No. 5,755,486 ("Wycech").[1]

3. The final rejection of claims 3 and 15 under 35 U.S.C. § 103 over U.S. Patent No. 4,884,834 ("Yamamoto") in view of U.S. Patent No. 5,755,486 ("Wycech") and in further view of U.S. Patent No. 5,782,730 ("Kawasaki").

4. The final rejection of claims 8-9 and 20-21 under 35 U.S.C. § 103 over U.S. Patent No. 4,884,834 ("Yamamoto") in view of U.S. Patent No. 5,755,486 ("Wycech") and in further view of U.S. Patent No. 4,692,475 ("Rowland").

5. The final rejection of claims 10 and 22 under 35 U.S.C. § 103 over U.S. Patent No. 4,884,834 ("Yamamoto") in view of U.S. Patent No. 5,755,486 ("Wycech") and in further view of U.S. Patent No. 5,782,730 ("Kawasaki") and U.S. Patent No. 4,692,475 ("Rowland") and U.S. Patent No. 5,021,513 ("Bagga").

[1] The December 10, 2008 Final Office Action and the June 9, 2008 Non-Final Office Action do not identify Wycech in the summary of the rejection of claims 2, 4-6, 14, and 16-8, but the Wycech reference is applied by the Examiner on page 4 of the Non-Final Office Action, which is expressly "repeated" in the Final Office Action.

VII. ARGUMENT

A. Ground of Rejection 1 (Final Rejection of Claims 1, 7, 11-13, 19 and 23-27 over Yamamoto) Should Be Reversed.

As the Federal Circuit has stated numerous times, in order to demonstrate anticipation under 35 U.S.C. §102, the proponent must show that the four corners of a single prior art document describe every element of the claimed invention. *Net Moneyin, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). Because the hallmark of anticipation is prior invention, the prior art reference must not only disclose all of the elements of the claim, but must also disclose those elements "as arranged in the claim." *Id.* The meaning of "arranged in the claim" is readily understood in relation to claim drawn to things such as ingredients mixed in some claimed order. *Id.* at 1370. In such instances, a reference that discloses all of the ingredients, but not in the order claimed, would not anticipate. *Id.* This example is not limited to the order in which ingredients are mixed. In fact, the Federal Circuit expressly stated that the "arranged in the claim" legal requirement applies to all claims and refers to the need for an anticipatory reference to show all of the limitations of the claims "arranged or combined in the same way" as the recited claims. *Id.*

Here, Yamamoto does not anticipate claims 1, 7, 11-13, 19 or 23-27 because Yamamoto does not disclose all of the claimed ingredients combined in the same way as the recited claims. Specifically, each of the claims that is subject to Ground of Rejection 1 requires, *inter alia*, the combination of ingredients, "from about 20%-30% by weight of an SBS block co-polymer; from about 5-20% by weight polystyrene; and from about 30-40% by weight of an epoxy resin." The claims and the specification make clear that polystyrene and the SBS block co-polymer are

separate ingredients. For example, polystyrene is explained as a homopolymer in paragraph 14 of the specification, and exemplified in the same paragraphs as the homopolymer Fina Crystal 500 and Fina Crystal 535. In Example 3, the polystyrene ingredient is the homopolymer Fina Crystal 500. (Specification, paragraph 59). Example 3 makes clear that the separate SBS block co-polymer ingredient is Fina Clear 530. (Specification paragraph 45, 59).

By contrast, Yamamoto does not disclose the homopolymer "polystyrene" as a separate ingredient anywhere in the four corners of the patent. Thus, Yamamoto certainly does not disclose polystyrene in combination with SBS block co-polymer and an epoxy resin in the claimed weight percentages. Accordingly, Yamamoto simply does not and cannot anticipate any of claims 1-27.

The Examiner has argued that because SBS block co-polymer is formed from both polystyrene chains and polybutadiene chains that Yamamoto's disclosure of SBS block copolymer necessarily discloses SBS block co-polymer in combination with the homopolymer polystyrene. This is factually incorrect.

The polystyrene chains that exist within an SBS block co-polymer are not stand-alone; rather, they are covalently bonded to polybutadiene chains. The results of such bonding are the creation of a different chemical entity – SBS block co-polymer – which has chemical and physical traits that are substantially different from polystyrene. See, for example excerpts from the catalog included as Evidence Exhibit A. In Evidence Exhibit A, various physical properties are listed for each of the polymers identified. Such properties include melt flow rate, tensile strength, and flex modulus. (Evidence Exhibit A, page 26). The properties of polystyrene are very different from those of SBS block co-polymer. For example, the melt flow rate of

polystyrene listed under the "Blow Molding, Extrusion and Injection Molding" section ranges from 1.4-4 g/10 min. (Evidence Exhibit A, page 26). The melt flow rate of SBS block co-polymer listed under the "Blow Molding, Extrusion and Injection Molding" section ranges from 7.5-11 g/10 min. (Evidence Exhibit A, page 30). As one of skill in the art understands, this is a substantial difference. In another example, the tensile strength for polystyrene ranges from 7-7.6 yield at 1000 psi (Evidence Exhibit A, page 26), and from 3-3.7 yield at 1000 psi for SBS block co-polymer (Exhibit 1, page 30). These substantial differences between SBS block co-polymer and the homopolymer polystyrene demonstrate that disclosure of SBS block co-polymer does not disclose the homopolymer polystyrene by itself or in combination with SBS block co-polymer in the claimed weight percentages.

Thus, for at least these reasons, the Yamamoto reference does not anticipate claims 1, 7, 11-13, 19 or 23-27, and this Board should reverse the final rejection of these claims.

B. Ground of Rejection 2 (Final Rejection of Claims 2, 4-6, 14 and 16-18 over Yamamoto in view of Wycech) Should Be Reversed.

1. Claims 2, 4-6, 14 and 16-18 Are Not Obvious over Yamamoto in view of Wycech

(a). The Examiner Failed To Establish A *Prima Facie* Case Of Obviousness

It is the Examiner's burden to set forth a *prima facie* case of obviousness in the initial or final Office Action. A *prima facie* case of obviousness has historically required that:

> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

MPEP § 2143 (Eighth Edition, Fifth Revision, August 2006) (*citing In re Vaeck*, 947 F.2d

488 (Fed. Cir. 1991).

So long as the motivation requirement for a *prima facie* case of obviousness is not rigidly applied, requiring the Examiner to show proper reasoning for combining prior art references is consistent with *KSR International Co. v. Teleflex, Inc.*, 127 S.Ct. 1727 (2007). In *KSR*, the Supreme Court stated that, "[i]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." *Id.* at 1741. Accordingly, the Court made clear that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *Id.* at 1731.

Here, there is no *prima facie* case of obviousness because even if the references are combined, the combination does not teach or suggest all the elements of Appellant's claims. Neither Yamamoto nor Wycech include any reference to polystyrene as a separate ingredient. For example, the word "polystyrene" cannot be found in either reference. The Examiner has not provided sufficient reasoning to make a *prima facie* case that it would have been obvious to one of skill in the art to have made the claimed combination of the homopolymer polystyrene, SBS block co-polymer, and rubber and epoxy resin in the particularly claimed weight percentages.

(b). If The Examiner Made A *Prima Facie* Case Of Obviousness, Appellant Rebutted The *Prima Facie* Case

Appellant has found that the relative weight percentages of SBS block co-polymer with the homopolymer polystyrene and epoxy resin, when used in an expandable composition, bring about

an unexpected result.

In particular, the homopolymer polystyrene acts a sponge for both SBS block co-polymer and epoxy resin. In other words, SBS block co-polymer and epoxy resin compete with one another for solubility in polystyrene. If too much SBS block co-polymer is included in the formulation, it displaces the epoxy resin from the homopolymer polystyrene, and the resulting formulation does not have the desired traits for an expandable reinforcer composition that can adhere to the surface of a structural member. Similarly, if too little SBS block co-polymer is included, the expandable reinforcer composition does not have the desired mechanical properties, such as compressive strength. Thus, a specific balance is required among the ingredients. The claimed weight percentages are balanced to prevent too much leaking of epoxy resin out of the formulation by controlling the amount of SBS block co-polymer in the formulation relative to the epoxy resin. None of specific weight percentages among the distinctly claimed ingredients, or the ratio of weight percentages of the claimed ingredients, are taught or suggested by the combination of Yamamoto and Wycech.

Moreover, when the claimed formulation is expanded, Appellant achieved the surprising result that the particular combination of ingredients, in their relative amounts, led to a composition that both expanded to a high degree (80-220%) while maintaining such a high degree of compressive strength (at least about 1400 psi). (Specification page 8, lines 9-19). As explained in earlier amendments and in earlier appeal briefs, this is surprising because one of skill in the art would expect that, the more the composition expands, the less likely it would be able to maintain such a compressive strength.

The evidence supporting the previous arguments is included in Evidence Exhibits B and C,

which are inventor declarations, in the Evidence Appendix. Specifically, Evidence Exhibit B provides data that a composition taught in the cited Wycech reference does not demonstrate the compressive strength, following expansion, as taught in the pending claims and specification. Thus, the results of the claimed combination are unexpected given the teachings of Wycech. Evidence Exhibit C distinguishes the SBS block co-polymer of the pending claims from polyisoprene, which the Examiner had argued was interchangeable with SBS block co-polymer. The two compounds are not interchangeable; SBS block co-polymer is not chemically cross linked and is much more easily processed and shaped. Thus, the inclusion of polyisoprene in combination with other ingredients does not teach or suggest the inclusion of SBS block co-polymer in combination with such ingredients.

For at least the reasons set forth hereinabove, this Board should reverse the final rejection of claims 2, 4-6, 14 and 16-18 under 35 U.S.C. § 103.

C. Ground of Rejection 3 (Final Rejection of Claims 3 and 15 over Yamamoto in view of Wycech and in further view of Kawasaki) Should Be Reversed.

This Final Rejection requires the combination of Yamamoto and Wycech, which for all the reasons set forth in detail, above, in Subsection A of the "ARGUMENT" Section does not teach all the elements of the independent claims from which dependent claims 3 and 15 depend. Additionally, there is no reason that one of skill in the art would look to the Kawasaki reference to modify the teachings Yamamoto or Wycech, as the Kawasaki reference is drawn to a pressure roller in a fixing system of a xerographic copying machine, laser beam printer or the like. And even if one did turn to the Kawasaki reference, it does not cure the deficiencies of the Yamamoto reference. For example, the word "polystyrene" cannot be found in the Kawasaki reference, either alone or in combination with SBS block co-polymer, epoxy resin, and rubber. Thus, the combination of

Yamamoto, Wycech and Kawasaki does not render obvious claim 3 or 15. Accordingly, this Board should reverse the Section 103 rejections of claims 3 and 15.

D. Ground of Rejection 4 (Final Rejection of Claims 8-9 and 20-21 over Yamamoto in view Wycech and in further view of Rowland) Should Be Reversed.

This Final Rejection requires the combination of Yamamoto and Wycech, which for all the reasons set forth in detail, above, in Subsection A of the "ARGUMENT" Section does not teach all the elements of the independent claims from which dependent claims 8-9 and 20-21 depend. The Rowland reference does not cure the deficiencies of the Yamamoto reference, even if used in combination with Wycech. Thus, the combination of Yamamoto, Wycech and Rowland does not render obvious claims 8-9 or 20-21. Accordingly, this Board should reverse the Section 103 rejections of claims 8-9 and 20-21.

E. Ground of Rejection 5 (Final Rejection of Claims 10 and 22 over Yamamoto in view of Wycech and in further view of Kawasaki and Rowland and Bagga) Should Be Reversed.

This Final Rejection requires the combination of Yamamoto and Wycech, which for all the reasons set forth in detail, above, in Subsection A of the "ARGUMENT" Section does not teach all the elements of the independent claims from which dependent claims 10 and 22 depend. None of the Kawasaki reference, the Rowland reference, or the Bagga reference (alone or in combination) cures the deficiencies of the Yamamoto reference, even if used in combination with Wycech. Thus, the combination of five independent references does not render obvious claim 10 or 22. Accordingly, this Board should reverse the Section 103 rejections of claims 10 and 22.

Dated: April 17, 2009

Respectfully submitted,

By: /Linda D. Kennedy/
Linda D. Kennedy
Registration No.: 44,183
Attorney for Applicant

VIII. CLAIMS APPENDIX

A clean copy of the claims of Application Serial No. 10/759,449 follows:

1. A composition useful for forming a reinforcing body, said composition comprising:

from about 20-30% by weight of an SBS block co-polymer;

from about 5-20% by weight polystyrene;

from about 0.5-5% by weight of a rubber; and

from about 30-45% by weight of an epoxy resin.

2. The composition of claim 1, said composition further comprising from about 0.5-5% by weight of a pigment.

3. The composition of claim 1, said composition further comprising from about 1-10% by weight hydrated amorphous silica.

4. The composition of claim 1, said composition further comprising from about 10-20% glass microspheres.

5. The composite of claim 1, said composition further comprising from about 0.1-5% by weight of a blowing agent.

6. The composition of claim 1, said composition further comprising from about 0.1-5% by weight of a catalyst.

7. The composition of claim 1, said composition further comprising from about 0.1-5% by weight of a curing agent.

8. The composition of claim 1, said composition further comprising a compound for lowering the blowing temperature of the composition.

9. The composition of claim 1, wherein said rubber is a nitrile-butadiene rubber and said epoxy resin is a bisphenol A-based liquid epoxy resin, and said composition further comprises:

from about 0.5-5% by weight of a pigment;

from about 1-10% by weight hydrated amorphous silica;

from about 10-20% by weight glass microspheres;

from about 0.1-5% by weight of a blowing agent;

from about 0.1-5% by weight of a catalyst;

from about 0.1-5% by weight of a curing agent; and

up to about 5% by weight of a compound for lowering the blowing temperature of the composition.

10. The composition of claim 9, wherein said pigment comprises carbon black, said blowing agent comprises azodicarbonamide, said catalyst comprises N,N-dimethyl phenyl urea, said

curing agent comprises dicyandiamide, and said compound for lowering the blowing temperature comprises zinc oxide.

11. A composition useful for forming a reinforcing body, said composition comprising:

from about 20-30% by weight of an SBS block co-polymer;

from about 5-20% by weight polystyrene;

from about 0.5-5% by weight of a rubber; and

from about 30-45% by weight of an epoxy resin,

wherein said composition has a percent expansion of from about 80-220% after heating thereof to a temperature of at least about 300°F.

12. A composition useful for forming a reinforcing body, said composition comprising:

from about 20-30% by weight of an SBS block co-polymer;

from about 5-20% by weight polystyrene;

from about 0.5-5% by weight of a rubber; and

from about 30-45% by weight of an epoxy resin,

wherein said composition has a compressive strength of at least about 1400 psi upon being expanded by heating to a temperature of at least about 300°F.

13. A composition useful for forming a reinforcing body, said composition comprising:

from about 20-30% by weight of an SBS block co-polymer;

from about 5-20% by weight polystyrene;

from about 0.5-5% by weight of a rubber; and

from about 30-45% by weight of an epoxy resin,

wherein said composition has a compressive strength of at least about 1400 psi and a percent expansion of from about 80-220% upon being expanded by heating to a temperature of at least about 300°F.

14. The composition of claim 13, said composition further comprising from about 0.5-5% by weight of a pigment.

15. The composition of claim 13, said composition further comprising from about 1-10% by weight hydrated amorphous silica.

16. The composition of claim 13, said composition further comprising from about 10-20% glass microspheres.

17. The composite of claim 13, said composition further comprising from about 0.1-5% by weight of a blowing agent.

18. The composition of claim 13 said composition further comprising from about 0.5-5% by weight of a catalyst.

19. The composition of claim 13, said composition further comprising from about 0.1-5% by weight of a curing agent.

20. The composition of claim 13, said composition further comprising a compound for lowering the blowing temperature of the composition.

21. The composition of claim 13, wherein said rubber is a nitrile-butadiene rubber and said epoxy resin is a bisphenol A-based liquid epoxy resin, and said composition further comprises:

from about 0.5-5% by weight of a pigment;

from about 1-10% by weight hydrated amorphous silica;

from about 10-20% by weight glass microspheres;

from about 0.1-5% by weight of a blowing agent;

from about 0.1-5% by weight of a catalyst;

from about 0.1-5% by weight of a curing agent; and

up to about 5% by weight of a compound for lowering the blowing temperature of the composition.

22. The composition of claim 21, wherein said pigment comprises carbon black, said blowing agent comprises azodicarbonamide, said catalyst comprises N,N-dimethyl phenyl urea, said curing agent comprises dicyandiamide, and said compound for lowering the blowing temperature comprises zinc oxide.

23. A composition of claim 13 wherein the percent expansion is from about 95% to about 200%.

24. A composition of claim 23 wherein the compressive strength is at least about 1600 psi.

25. A composition of claim 13 wherein the percent expansion is from about 129% to about 147%.

26. A composition of claim 25 wherein the compressive strength is from about 1422 psi to about 2129 psi.

27. A composition of claim 25 wherein the compressive strength is at least about 1600 psi.

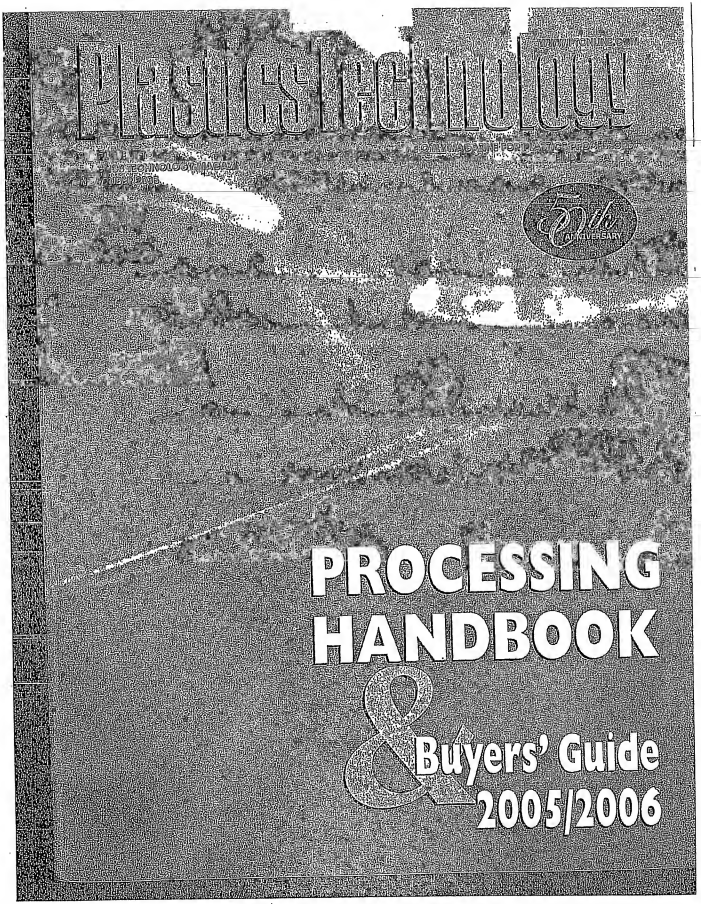
IX. EVIDENCE APPENDIX

Evidence Exhibit A: Excerpt from Plastics Technology, Processing Handbook & Buyers Guide 2005/2006. Following discussion of this his evidence in the Interview on January 21, 2009, this evidence was introduced to the record in the Response to Office Action dated February 23, 2009.

Evidence Exhibit B: Declaration 1 of Chin-Jui Chang, dated October 16, 2002, filed in the parent case, serial no. 09/572,754, and included in the August 16, 2006 Appeal Brief Evidence Appendix and in the March 6, 2008 Appeal Brief Evidence Appendix filed in the case presently on appeal.

Evidence Exhibit C: Declaration 2 of Chin-Jui Chang, dated October 16, 2002, filed in the parent case, serial no. 09/572,754, and included in the August 16, 2006 Appeal Brief Evidence Appendix and in the March 6, 2008 Appeal Brief Evidence Appendix filed in the case presently on appeal.

Evidence Exhibit A


Plastics Technology
PROCESSING
HANDBOOK
&
Buyers' Guide
2005/2006

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features/ Applications	Type	Filler/ Reinf. Type	Melt Flow Rate, g/10 min	Density, g/cc	Tensile Str. @ Yield, 1000 psi	Elongation @ Yield, %	Flex Modulus, 10E5 psi	Notched Izod Impact, ft-lb/in. (1/8 in.)	Defl. Temp (66 psi/264 psi)
Schulman, A.	Polytrope TPP 504-31	COL,MOL	–	–	–	0.92	2.[illegible]	–	0.5	[illegible]	[illegible]
	Polytrope TPP 508	PNT,HFL,AUT	–	–	8	0.91	2.5	–	0.8	[illegible]	[illegible]
	Polytrope TPP 510	COL,MOL	–	–	6.8	0.91	3	–	1	14.2	[illegible]
	Polytrope TPP 512	COL,MOL	–	–	–	0.91	3.5	–	1.2	[illegible]	[illegible]

PP/PS ALLOY

BLOW MOLDING AND INJECTION MOLDING

Basell N.A.	Hivalloy G7056	HI	–	35% GF	10	1.2	12.7	–	6.0	2.5	[illegible] 205

INJECTION MOLDING

Basell N.A.	Hivalloy G-120	GP,HI,ST	–	–	5	0.94	4.0	6	2.2	2.5	200 140
	Hivalloy G-130	GP,HFL	–	–	25	0.93	3.7	7	1.7	2.5	190 130
	Hivalloy G-170	GP,HI	–	–	5	0.92	3.9	10	1.7	[illegible]	190 190
	Hivalloy G170	GP,HI	–	–	5	0.93	4.1	9	1.6	[illegible]	194 191
	Hivalloy G3056	IM,GP,HI	–	–	2	0.92	3	25	1.1	[illegible]	170 105
	Hivalloy G3057	GP,HI	–	–	6	0.91	3.6	7	1.7	[illegible]	190 190
	Hivalloy G3058	GP,HI	–	–	61	0.91	3.4	9	1.6	[illegible]	106 125
	Hivalloy G6064	GP	–	–	5	1.2	3.1	3	2.8	2.7	205 140
	Hivalloy G7056	IM,GP,HI	–	35% GF	11	1.18	9.5	4	6.3	5	310 260
	Hivalloy G7062	IM,GP	–	20% GF	8	1.05	6.8	–	3.7	5	295 215
	Hivalloy G7072	GP	–	35% GF	7	1.2	16.4	–	11	2	320 302

POLYSTYRENE—GENERAL PURPOSE

BLOW MOLDING, EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type	Melt Flow Rate, g/10 min	Density, g/cc	Tensile Str. @ Yield, 1000 psi	Elongation @ Yield, %	Flex Modulus, 10E5 psi	Notched Izod Impact, ft-lb/in. (1/8 in.)	Deflection Temp (66 psi/264 psi)
Ambri Polymers	API-370-21	GP,TRP,HR	S	2	1.06	–	–	–	0.4	203
Chevron Phillips	EA-3060	TF,TRP,HCR	–	8	1.05	7	–	4.4	[illegible]	188
Dow Plastics	Styron 618	MED,TEN,TRP,HR	–	1.4	1.04	7.5	–	4.5	0.4	202 179
	Styron 623	MED,TRP,HR	–	4	1.04	7.3	–	4.6	0.4	203 179
	Styron 605	GP,MED,TRP,HR	–	2.2	1.04	7.6	–	4.7	0.3	208 182
	Styron 6850	GP,MED,TRP,HR	–	1.5	1.04	7.7	–	4.6	0.4	205 193
Ineos Styrenics	Polystyrene 156H	GP,TF,PKG	–	3.5	1.04	–	2	4.4	0.3	177
Total Petrochem.	Atofina 535	HR,HIT	–	4	–	7.4	–	4.6	[illegible]	[illegible]

BLOW MOLDING AND INJECTION MOLDING

Dow Plastics	Styron 6660	GP,MED,TRP,HR	–	8	1.04	6.6	–	4.6	0.3	186 171

EXTRUSION

Chevron Phillips	EA-3000	THR	–	1.8	1.04	6	–	4.4	0.4	197
	EA-3100	THR	–	3	1.05	7.8	–	4.4	0.4	195
	EA-3200	FDY,HR	–	7	1.04	7.4	–	4.3	0.4	196
Dart Polymers	GPPS PS-102	DS,HGL,TRP,HR	–	2.5	1.05	7	–	–	[illegible]	200
Huntsman Chemical	1903	GP,HI,CST	–	3.5	1.04	3.5	–	0.3	[illegible]	169
	201	GP,HMW,HIT,PKG	–	1.4	1.04	7.4	–	4.7	0.4	200
LG Chemical	20HR-E	HR	–	5	1.05	6.8	–	4.7	0.9	203 205

POLYSTYRENE—GENERAL PURPOSE *(Continued)*

EXTRUSION *(Continued)*

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. type, %	Melt Flow Rate g/10 min	Density g/cc	Tensile Strength Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp F (66 psi; 264 psi)	UL94 Rating (1/8 in)
LG Chemical	25SP-E	HI	–	2.8	1.06	7.1	–	4.7	0.9	200;207	HB
Nova Chemicals	2114	HI,PKG	–	2.3	1.03	4.8	–	3	2.8	–;199	HB
Total Petrochem.	Atofina 523	HFL	–	11	–	6.6	–	4.8	–	–	–
	Atofina 624B	GP,HGL	–	9	–	6.7	–	4.6	–	–	–
	Atofina 685	–	–	1.8	–	7.8	–	4.3	–	–	–

EXTRUSION, SHEET

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. type, %	Melt Flow Rate g/10 min	Density g/cc	Tensile Strength Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Dow Plastics	Styron 697	TRP	–	1.6	1.04	6.5	–	–	–	–;218	–
Huntsman Chemical	1101LR	HMW,PKG	–	1.4	1.04	7.4	–	4.8	0.4	–;200	–
Ineos Styrenics	Polystyrene 166M0	GP,LO,TF,HR	–	1.6	1.04	–	8	4.8	0.3	–;201	–
Total Petrochem.	Atofina 616E	GP	–	2.6	–	6	56	3.4	2.2	–	–

EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. type, %	Melt Flow Rate g/10 min	Density g/cc	Tensile Strength Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	MO-3600	GP	–	6	1.06	7.6	–	4.6	0.4	–;190	–
Dow Plastics	Styron 615APR	GP,TRP	–	14	1.04	6.4	–	4.6	0.3	191;188	HB
Huntsman Chemical	210	GP,HFL,BLN	–	38	1.04	4.8	2	0.4	0.4	–;154	–
Ineos Styrenics	Polystyrene 146D	GP,HFL	–	14	1.04	–	2	4.4	0.3	–;173	–
	Polystyrene 147F	GP,MFL	–	9	1.04	–	2	4.6	0.3	–;186	–
	Polystyrene 140G	GP,MOL,PKG	–	6	1.04	–	2	4.5	0.3	–;191	–
	Polystyrene 166 M	MED,TRP,HR	–	1.6	1.04	7.5	–	4.8	0.3	–;201	HB
Nova Chemicals	1200/1204	MOL,TEN	–	1.6	1.04	7.6	–	5	0.4	–;208	HB
	1210	HR,HMW	–	1.6	1.04	7.4	–	4.7	0.4	–;200	HB
	1220/1230	MOL	–	1.9	1.04	7.4	–	4.7	0.4	–;200	–
	1260/1290	MOL	–	1.8	1.04	7.8	–	6	0.4	–;203	HB
	1300/1301	MOL,HR,PKG	–	3.6	1.04	7	–	4.4	0.4	–;200	HB
	1600	HR,MFL	–	6.6	1.04	8.6	–	6	0.4	–;202	HB
	2100	ESC,HR,PKG	–	8.6	1.04	6.6	–	4.4	0.4	–;180	–
	2110	MOL,HR,PKG	–	3.4	1.04	6.2	–	5	0.4	–;196	HB
	2600/2504/2590	HR,BLN	–	7	1.04	6.6	–	5	0.4	–;185	HB
	FX110	MOL,MLS	–	1.3	1.04	–	–	4.7	0.4	–;205	–

INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. type, %	Melt Flow Rate g/10 min	Density g/cc	Tensile Strength Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Amer. Polymers	API 390	GP,TRP	–	8	1.05	–	–	–	0.3	–;160	–
	API 392	GP,TRP,HFL	–	12	1.05	7.8	–	4.5	0.3	–;180	–
	API 395	GP,THR,HFL	–	16	1.05	14.6	–	3.6	0.3	–;100	–
Chevron Phillips	MO-3100	THR	–	3	1.06	7.0	–	4.5	0.4	–;163	–
	MC-3600	HFL	–	16	1.06	7	–	4.6	0.4	–;179	–
	MC-3700	FR	–	19	1.05	8	–	4.5	0.4	–;173	–
Dart Polymers	GPPS PS-106	HGL,TRP,MFL,OP	–	8	1.06	6.6	–	–	–	–;190	HB
	GPPS PS-110	FCY,TRP,HFL	–	16	1.06	6.6	–	–	–	–;162	HB
Delta Polymers	GPPS-100	GP	–	8	1.04	–	–	4.6	0.4	–	–
Dow Plastics	Retain PS-4000	RM,PKG,POR	–	5.6	–	3.6	–	3.3	1	–;166	–
	Styron 612	GP	–	9	1.04	6.7	–	4.8	0.3	203;186	–
	Styron 666APR	GP	–	8.5	1.04	7	–	4.7	0.3	200;176	HB
	Styron 695	GP,TRP,HR	–	1.5	1.04	7.6	–	4.6	0.4	210;184	HB
Federal Plastics	FPC 2	GP	–	3	1.06	–	–	–	0.3	–;200	–
	FPC 3	GP	–	11	1.05	–	–	–	0.3	–	–
	FPC 4	GP,THR	–	4	1.06	–	–	–	0.3	–	–
	FPC 5	GP,TRP,MFL	–	12	1.06	7.5	–	–	0.3	–	–
	FPC 6	GP,HFL	–	22.5	1.06	6	–	–	–	–	–
	FPC 7	GP,TRP	–	7.5	1.06	–	–	–	0.3	–;166	–

POLYSTYRENE—IMPACT (Continued)

INJECTION MOLDING (Continued)

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type	Melt Flow Rate g/10 min	Density g/ccm	Tensile Str. at Yield 1000 psi	Elongation at Yield, %	Flex. Modulus 10E5 psi	Notched Izod Impact ft-lb/in. (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	
Huntsman Chemical	878	GP,CST	–	3.5	1.04	7.2	–	4.5	0.4	–;200	
	880	COL,GP,HI	–	8.5	1.04	3	50	2.4	3.2	–;100	
Ineos Styrenics	Polystyrene 446 C	MI,GP	–	14	1.04	3.1	–	2.4	1.2	–;192	
LATI USA	Lastirol RV0	FR,HI,HFL	–	0.5-0.5	1.18	4.4	2	2.9	1.5	–;144	
	Lastirol RV2	DS,FR,HI,HFL	–	0.2-0.4	1.09	5.8	2	4	1.3	–;189	
LG Chemical	403AF	FR,WTR	–	9.6	1.05	3.8	4	3.3	2.2	194;182	V
	405AF	FR	–	14	1.16	3.7	4	3.3	1.6	182;182	V
	407AF	FR	–	9	1.1	3.7	4	3.4	2.2	184;192	V
	40AF	FR,GP	–	10	1.18	3.7	4	3.1	2	188;184	V
	478EF	FR	–	12	1.04	3.7	4	3.4	2.2	183;188	V
	50IS	GP	–	7.5	1.03	3.8	5	3.1	1.9	188;188	H
	50IS-L	GP	–	7.5	1.03	4	5	3.2	1.9	185;108	H
	80HR	HR	–	4	1.08	4.1	5	3.1	2.4	199;194	H
	50HR-G	HR,HFL	–	5.5	1.03	3.8	5	3.1	2.4	188;194	H
	SF-510	HI,HFL	–	12	1.04	3.8	5	3.3	2.8	184;184	HI
	SG-910	HGL,HI	–	3.7	1.04	4.8	5	3.8	3.1	207;188	HI
	SG-980	HGL,HI	–	5.5	1.04	5.1	5	3.6	2.4	198;194	HE
	SG-870	HGL,HI	–	8.5	1.04	5.3	5	3.7	2	188;184	HE
	SI-610	HI,HFL	–	8.5	1.04	3.8	5	3.1	3.8	205;198	HB
Network Polymers	NPS90-0304	–	–	2.4	1.04	4.1	–	3.3	4	–;180	HB
	NPS90-0645	–	–	3	–	–	–	2.1	3	–;172	HB
	NPS80-0802	–	–	8	1.04	–	–	2.8	1.8	–;178	–
	NPS90-0820	HI	–	8	1.04	–	–	2.8	1.8	–;178	–
	NPS90-0827	–	–	8	1.04	–	–	2.8	2.7	–;178	–
Nova Chemicals	4210/4214	–	–	3.5	1.04	5.2	–	4	1	–;192	HB
	4211	–	–	4	1.04	5.8	–	3.0	1	–;182	HB
	4501	HI	–	8.5	1.04	4.2	–	3.5	1.2	–;189	HB
	5100/5104	HI,ST	–	2.7	1.04	3.8	–	3.4	1.5	–;192	HB
	5124	HGL,HI	–	4.3	1.04	3.2	–	3.2	1.8	–;185	HB
	5190	HGL,HI	–	5.5	1.04	4.8	–	3.2	1.0	–;180	HB
	5511	–	–	0	1.04	3.5	–	2.8	2.4	–;180	HB
	5620	ST,HR	–	2.7	1.04	2.8	–	8	1.8	–;180	HB
	5711	HI,MED,HFL	–	15.5	1.04	4.2	–	3.1	1.8	–;180	HB
	5751	MI,MED,HFL	–	18	1.04	3.2	–	3.5	1.5	–;170	HB
	731G	HI,ST	–	4	1.04	3.8	–	2.5	2.2	–;184	HB
Plastix World	DalcelStyrol GH10	FR,HR	–	8	1.15	3.1	–	9	1.8	–;178	V-0
	DalcelStyrol GW30	FR,UVR	–	10	1.18	4.9	–	3	1.2	–;178	V-0
	DalcelStyrol GW50	FR,UVR	–	5	1.15	3.5	–	2.6	1.3	–;176	V-0
	DalcelStyrol SK50H	FR	–	4	1.12	5.5	–	3.7	0.5	–;187	V-2
	DalcelStyrol SK60	FR,UVR	–	4	1.05	4.4	–	3.8	1.5	–;175	V-2
RTP	400HI-FR	BLK,FR,HI,NAT	–	–	1.17	3.3	–	4	1.7	205;175	V-0
	400HI-SI2	BLK,HI,LUB,NAT	–	–	1.03	3.1	–	3.2	2	105;170	HB
	401HI	–	10%	–	1.11	6	–	5	1.1	210;100	HB
	408HI	BLK,HI,NAT	20% GF	–	1.18	6	–	8	1.2	200;190	HB
	406HI	BLK,HI,NAT	30% GF	–	1.25	11.6	–	14	1	220;180	HB
	ESD A 400 HI	AST,BLK,IM	CB	–	1.1	3.2	2	3.3	1.2	205;175	HB
	ESD A 480 HI	AST,COL,HI	CF	–	1.08	6.6	0.6	8.5	1.1	210;100	HB
	ESD C 400 HI	AST,BLK,ED,IM	CB	–	1.1	2.8	2	2.8	1.2	205;175	HB
	ESD C 400 HI	AST,COL,ED,HI	CF	–	1.08	7	0.8	10	1	210;180	HB
Shuman	810	BLK	–	4-16	1.05	4.4	–	–	1.8-2	–;167	HB
	811	BLK,MI	–	4-15.9	1.05	–	–	–	0.2-1.8	–;190	–
	811/881	BLK,MI,MGL,MOL	–	4-15.9	1.1	5.2	–	–	0.8	–;190	–
	SPB10/880	BLK,HI,MOL	–	8-10	1.1	4.4	–	–	1.8	–;167	HB

POLYSTYRENE—IMPACT *(Continued)*

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
Spartech	SC2-1090U	GP,HST,LUB,UVR	–	2.7	–	4.2	–	3.7	2	–	–
	SC2-1098	GP,HST,LUB	–	6.4	–	9	–	3.6	0.7	–	–
	SC2-1099	GP,HST,LUB	–	6.6	–	7	–	3.4	1.5	–	–
	SC2-1220	GP,HST,LUB	20% GF	–	1.18	10.5	2	9.5	1.1	–	–
	SC2-1230	GP,HST,LUB	30% GF	–	1.28	12	1	12	1.2	–	–
	SC2-12830	CCR,GP,HST,LUB	30% GF	–	1.28	12	1	12	1.2	–	–
TP Composites	HIPS AS	AST	–	–	1.06	3	–	0.6	1.5	200;170	HB
	HIPS FR	FR	–	–	1.15	2.9	–	2.0	1.5	205;190	V-0
Total Petrochem.	Atofina 826	FCY,HI	–	8	–	3.6	50	3.4	2	–	–

INJECTION MOLDING AND STRUCTURAL FOAM

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
Nova Chemicals	5600/5604	SLD	–	7	1.04	3	–	3	2	–;186	HB

STRUCTURAL FOAM

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
Dow Plastics	Styron 425	GP,HI,MOL	–	12	1.04	4.5	–	–	1.2	–;199	–
	Styron 487	GP,HI,MOL	–	2.5	1.04	2.9	–	2.4	1.6	182;167	–
	Styron 4550	GP,HI,MOL	–	10	1.04	2.9	–	–	2.7	–;180	–
	Styron 4040	GP,HI,MOL	–	3	1.04	3.8	–	–	2.7	–;192	–
	Styron 6087SF	GP,HI,FM	–	–	0.98	–	–	2.8	–	183;168	V-0/5V
	Styron 6515	GP,HI,MOL	–	7.5	1.65	–	–	2.6	1.5	–;185	V-0
	Styron 667	GP,MED,HR,HFL	–	8	1.04	6.2	–	–	0.8	–;202	–
	Styron 668	GP,MED,HR,HFL	–	2	1.04	6.2	–	–	0.3	–;216	–
Nova Chemicals	5540	HGL,HI	–	10	1.04	3.6	–	2.9	1.7	–;188	HB
	6810	MGL,ST	–	3.5	1.04	4	–	2.6	2.3	–;186	HB

SAN COPOLYMER

EXTRUSION

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
EniChem	Kostil 6265	CHR	–	18	1.07	9.7	–	5.2	–	–;183	–
	Kostil 6365	CHR,HFL	–	30	1.07	9.6	–	5.1	–	–;183	HB
	Kostil PD-D265	CHR	–	20	1.08	10.9	–	5.2	–	–;187	HB
	Kostil PD-C365	CHR,HFL	–	30	1.08	10.6	–	5.2	–	–;187	HB

EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
BASF/Styrenics	Luran 368R	GP,TRP	–	12	1.08	10.9	–	–	0.5	218;208	HB
	Luran 388S	GP,TRP	–	6	1.08	12.2	–	–	0.6	217;210	HB
Dow Plastics	Tyril 1000B	CHR,GP,TRP,HR	–	8	1.08	10	–	5.4	0.3	–;210	HB
	Tyril 880	CHR,GP,TEN,TRP	–	3.5	1.06	11.9	–	5.9	0.6	–;216	HB
	Tyril 880B	CHR,GP,TEN,HR	–	3.5	1.08	11.9	–	6.0	0.5	–;216	HB

INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/Applications	Filler/Reinf. Type	Melt Flow Rate (g/10 min)	Density (g/cc)	Tensile Str. at Yield (1000 psi)	Elongation at Yield (%)	Flex Modulus (10^5 psi)	Notched Izod Impact (ft-lb/in.) (1/8 in.)	Deflection Temp. F (66 psi; 264 psi)	UL 94 Rating (1/8 in.)
Apio	SAN900L	–	–	8	1.07	9.9	3	5.9	0.2	196;174	–
BASF/Styrenics	Luran 358N	GP,HGL,TRP,HFL	–	27	1.08	10.4	–	–	0.5	216;208	HB
Dow Plastics	DowSan 100	–	–	6	1.07	–	–	5.5	–	–;214	–
	DowSan 111	–	–	13	1.07	–	–	5.5	–	–;213	–
	Tyril 1011	CHR,MOL,UVR,AUT	–	7	1.08	9.3	–	5.2	0.3	215;–	HB
	Tyril 125	GP,BLN	–	25	1.07	8	–	5.9	0.2	–;212	–
	Tyril 990	CHR,GP,MOL,TRP	–	8.7	1.07	9.7	–	6.1	0.4	–;219	HB
EniChem	Kostil 6268	CHR	–	16	1.07	9.7	–	5.2	–	–;193	HB

SAN Copolymer *(Continued)*

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
RTP	500TFE6	BLK,LUB,NAT	–	–	1.1	10	–	5	0.5	210;200	HB
	501	COL	10% CG	–	1.16	11.6	2	8	0.7	216;206	HB
	501 FR	COL,FR,MST,MOL	10% CG	–	1.39	10	1.6	8	1.1	215;205	V-0
	501 HB	COL,MST,MOL,FLX	10% CG	–	1.15	11.6	2	8	0.7	215;206	HB
	503	COL	20% CG	–	1.22	16	1.6	10	1	220;210	HB
	503 FR	COL,OS,FR,ST	20% CG	–	1.46	14	1.6	12	1	220;210	V-0
	503 HB	COL,OS,MOL,LW	20% CG	–	1.22	15	1.6	1	1	220;210	HB
	503TFE10	BLK,LUB,NAT	20% GF	–	1.3	14	–	10	1	216;206	HB
	505	COL	30% CG	–	1.31	16.5	1.2	14	1	226;212	HB
	505 FR	COL,OS,FR,ST	30% CG	–	1.58	16	1	16	1	226;210	V-0
	505 HB	COL,OS,MST,ST	30% CG	–	1.31	16.5	1.2	14	1	226;212	HB
	506	COL	36% CG	–	1.36	18	1.1	14	1	230;214	HB
	506 HB	COL,OS,ST,TEN	36% CG	–	1.36	16	1.1	14	1	230;214	HB
	507	COL	40% CG	–	1.4	17	1.1	18	1	230;217	HB
	507 HB	COL,OS,ST,TEN	40% CG	–	1.4	17	1.1	18	1	230;217	HB
Schulman, A.	ComAlloy 240-3020	OS,ST,TEN	20% CG	6-16	1.22	15.2	–	12.2	1	220;210	HB
	ComAlloy 240-3030	OS,ST,TEN	30% CG	6-16	1.3	17	–	16	1.1	226;216	HB
	ComAlloy 240-3040	OS,ST,TEN	40% CG	6-16	1.4	18.4	–	18.7	1.1	230;220	HB
	ComAlloy E-130408	GP	30% GF	2.8	1.3	–	–	14.5	0.7	217;212	–
Spartech	SC6-1090	GP,HGL,HST,LUB	–	–	1.07	8	–	5.1	0.4	–	–
	SC6-1096	GP,HGL,HST,LUB	–	–	1.07	10.6	–	5	0.6	–	–
	SC6-6090	GP,HGL,HST,LUB	–	–	1.07	9	–	5.1	0.4	–	–

Styrene Butadiene Block Copolymer

BLOW MOLDING AND EXTRUSION

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin KR05NW	MED,PRN,TRP,OP	–	7.5	1.01	3.7	–	2.1	0.8	–;183	HB

BLOW MOLDING, EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin KR05	MI,GP,ST,TRP	–	7.5	1.01	3.7	–	2.1	0.0	–;183	HB
Total Petrochem.	Finaclear 520	HI,TF,PKG	–	7.5	1.01	3.	200	1.8	16	–	–
	Finaclear 530	LGE,MOL	–	11	1.02	6.6	200	1.9	0.3	149;–	–

EXTRUSION, BLOWN FILM

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin KR10	MI,GP,MED,ST	–	7.5	1.01	3.7	–	2.1	0.0	–;163	HB

EXTRUSION, SHEET

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin KK38	GP,HI,ST,TRP	–	9	1	1.9	–	1.6	–	–;143	HB

EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin BK10	GP,HI,ST,TF	–	15	1.01	3.1	–	2.2	–	–;144	–
Firestone	Stereon 840A-842A	GP,TRP,BLN	–	8-15	0.96	2	800	–	–	–	–

INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features/ Applications	Filler/ Reinf. Type %	Melt Flow Rate g/10 min	Density g/cc	Tensile Str. at Yield 1000 psi	Elongation at Yield %	Flex Modulus 10E5 psi	Notched Izod Impact ft-lb/in (1/8 in)	Deflection Temp. F (66 psi; 264 psi)	UL94 Rating (1/8 in)
Chevron Phillips	K-Resin KR01	MI,GP,MED,PRN	–	8	1.01	4.4	–	2.2	–	–;170	HB
	K-Resin KR03	MI,GP,MED,ST	–	7.5	1.01	3.7	–	2.1	0.8	–;183	HB
	K-Resin KR03NW	GP,MED,PRN,TRP	–	7.5	1.01	3.7	–	2.1	0.8	–	HB
	K-Resin KR52	GP,HGL,HI	–	5	1.02	4.1	–	2.7	3.6	–;188	–

Evidence Exhibit B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Docket No.: 26845-B
CHANG, CHIN-JUI et al.	
Serial No.: 09/572,754	Group Art Unit No.: 1772
Filed: May 16, 2000	
SOUND DEADENING AND STRUCTURAL REINFORCEMENT COMPOSITIONS AND METHODS OF USING THE SAME.	Examiner: M. Patterson

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

DECLARATION 1

I, CHIN-JUI CHANG, declare and state as follows:

1. I am one of the inventors named on the above-referenced patent application. I am a group leader in the Structural Materials section of Sika Corporation.

2. Under my direction and control, the composition set forth in Table 1 of this Declaration was used to prepare a composition following the procedures described in the text of U.S. Patent No. 5,755,486 to Wycech which was cited by the Examiner in the second office action of this application. The percent expansion and compressive strength of the Wycech composition was determined and is reported in Table 1 below. The composition reported in Table 1 corresponds exactly to the preferred formulation of Table 1 in the Wycech '486 patent.

Ingredient	Trade Name	Composition
Epoxy Resin	Araldite 6010[1]	50.45%[2]
Acrylonitrile-Butadiene Rubber	Nipol 1312 LV	4.33%
Calcium Carbonate	Winnifil SPT	5.81%
Carbon Black	Black Powder	0.13%
Fumed Silica	Cab-O-Sil TS720	3.55%
High Strength Glass Spheres	B38	22.4%
Curing Agent	Dicyandiamine G	4.33%
Accelerator	Amicure UR	1.29%
Blowing Agent	Celogen OT	0.71%
Volume Expansion, %		44.0% ± 0.1
Compressive Strength, psi		1131.0 psi ± 143.2

[1] A liquid bisphenol-A based epoxy resin.
[2] These percentages by weight correspond to the percentages by weight given in Table 1 of the Wycech patent.

3. These data clearly demonstrate that the compositions taught by Wycech do not exhibit sufficient volumetric expansion or compressive strength for use in structural reinforcement applications according to the invention. Wycech does not disclose a reinforcing composition which has a percent expansion of from about 80-220% as is recited by claims 11, 16, and 18 of the patent application. Furthermore, Wycech does not disclose a composition having a compressive strength of at least about 1400 psi as is recited by claim 12 and 17 of the patent application. By comparison, the present application discloses a compressive strength of at least about 1400 psi on page 8, line 24, and a percent expansion of

from about 80-220% on page 8, line 17. A specific example is provided in Example 3 which provides a composition meeting all of the claim limitations of the independent claims.

I further declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that wilful, false statements and the like are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and such wilful false statements may jeopardize the validity of any patents issued from the parent application.

Any additional fee which is due in connection with this Declaration should be applied against Deposit Account No. 19-0522.

Chin-Joi Chang

Date: 10-16-2002

Evidence Exhibit C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Docket No.: 26845-B
CHANG, CHIN-JUI et al.	
Serial No.: 09/572,754	Group Art Unit No.: 1772
Filed: May 16, 2000	
SOUND DEADENING AND STRUCTURAL REINFORCEMENT COMPOSITIONS AND METHODS OF USING THE SAME	Examiner: M. Patterson

Assistant Commissioner of Patents
Washington, D.C. 20231

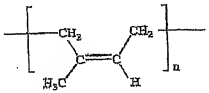
Sir:

DECLARATION 2

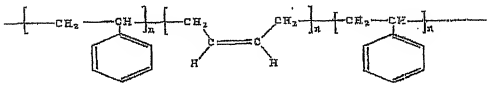
I, CHIN-JUI CHANG, declare and state as follows:

1. I am one of the inventors named on the above-referenced patent application. I am a group leader in the Structural Materials section of Sika Corporation.

2. Polyisoprene and SBS Block copolymer are fundamentally dissimilar because polyisoprene is a diene rubber that is a vulcanizable elastomer while SBS Block copolymer is a thermoplastic elastomer. Vulcanizable elastomers must be crosslinked by heating to provide strength and toughness, and are soft at room temperature. SBS Block copolymer can be handled like a thermoplastic elastomer and provides strength and toughness at room temperature without vulcanization. Upon cooling, SBS Block copolymer becomes hard and plastic. The structures of polyisoprene and SBS Block copolymer are as follows:



Polyisoprene



SBS Block copolymer

3. As is evident from these structures, SBS Block copolymer and polyisoprene are structurally very dissimilar. The structural characteristics of the SBS Block copolymer and polyisoprene clearly impart functional properties that are not consonant with one another. This is critical to an appreciation of why polyisoprene and SBS Block copolymer are not interchangeable for use in the present application. SBS Block copolymer is not covalently bonded, while polyisoprene is covalently bonded. Polyisoprene must undergo a chemical process of crosslinking called vulcanization, which results in a homopolymer having covalent bonds. The polymer process for SBS Block copolymer is reversible unlike that for vulcanized polyisoprene. In contrast, SBS Block copolymer is unique because it is not chemically crosslinked. Therefore, it is more easily processed and can be shaped more readily. By virtue of being a thermoplastic elastomer, SBS Block copolymer has two distinct phases that cause it to become fluid and rubbery at higher temperatures and hard and plastic at lower temperatures, making SBS Block copolymer ideal for use in structural foams for reinforcing hollow bodies. Polyisprene lacks such characteristics and properties.

4. I further declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful, false statements and the like are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and such willful false statements may jeopardize the validity of any patents issued from the patent application.

Any additional fee which is due in connection with this Declaration should be applied against Deposit Account No. 19-0522.

Chin-Jui Chang

Date: 10-16-2002

X. RELATED PROCEEDINGS APPENDIX

No related proceedings are referenced in Section II above. There are no decisions in related proceedings to include. Thus, this Appendix is included, but has no contents.